IN THE SPECIFICATION

[0009] The present invention disclosed comprises a method for easily adding collaboration functionality to new and existing software. The invention allows seamless collaborative operations at the whole product level, but very importantly, comprises a method for dividing monolithic work products, such as, but not limited to, documents into physical and logical subsets of the work product. In another major aspect of the invention, there is a method that enables separate control of actions within the complete or subsets of the divided work product. These methods to divide normally monolithic work products and determine what actions can occur within these subsets of the work product enable a number of other processes that are additional aspects of the invention. It is also important to emphasize that while these processes occur at the subdivision level, a subdivision can be of the size of the whole work product itself. It is also important to note that the use of participant is broadly applied to include human and non-human agents. It is also important to emphasize that individuals may find the use of this technology useful in a variety of aspects, not the least of which, as an extremely easy way to provide a central repository of useful information that is readily available anywhere in the world and accessible through software they currently use. In addition, other processes that are aspects of this invention include, but are not limited to, the following:

1) The aspect of adding collaboration functionality to software so multiple people can more effectively and naturally work on the same work product anytime, anyplace. It should be noted that anytime, anyplace obviously includes the subsets of same time, same place;

same time, different place; same place, different time; and different time, different place. Although not limited to the following, the major collaborative work activities supported through the Collaboration Engine Process include: project and work product management; shared work product creation and editing; and the capture of discussions and support statements related to the development of the shared work product.

a) An additional aspect of this invention is the process currently incorporated within, but not limited to the current manifestation, Collaboration Engine technology that automatically recognizes when another person begins to work on the same work product and can provide automatic control and updates to other participants who log on and begin to work on the same work product.

b) In the current manifestation, but not limited to this manifestation, of this process, participants interact with the shared work product enabled by the Collaboration Engine through the Collaboration Engine Interface. Currently, the Collaboration Engine Interface can be subdivided into two major ways that end users interface with Collaboration Engine Components. First is through a Collaboration Explorer that is placed in a docked window and the second is through the use of short cut menus directly within the shared work product. The Collaboration Explorer is used as a simple, intuitive, natural interface to manage such things as, but not limited to, projects, participants, and shared work products. However, there is no limit to the variety of ways that human and non-human agents could interact with the collaboration server to effect useful storage of a variety of data of all types and formats. For example, subdivisions can be displayed in a web browser, converted to speech but still managed and persisted through the Collaboration Engine Component

as any other subdivision, i.e., the media being stored and manipulated can be any media reducible for presentation and storage by a computing device or the interface can be altered and this still fits within the invention being described.

c) As noted earlier as a major aspect of this invention, the ability to identify and control separately the actions within subdivisions of the divided work product enables collaborative interaction within a given work product by the ability to capture where a particular user is within a shared work product. The Key Capture Component captures key strokes and this information is passed to the Collaboration Handler which determines the allowed actions that a participant may perform at the time with the shared work product. The Collaboration Handler initiates actions with and responds to actions from both the Collaboration Explorer and directly through the shared work product. The Collaboration Engine Server interacts with a database in a conventional manner to persist information.

2) Another aspect of this invention is that these processes can occur truly anytime, anyplace, offline, i.e., not connected to another computer, or online.

3) Another aspect of this invention is the process whereby work that is performed on subdivisions offline is automatically synchronized with existing work when transitioning to online work.

4) Another aspect of this invention is the process whereby one participant who does not have control of a subdivision can create suggested alternatives for that subdivision.

5) Another aspect of this invention is the process whereby a subdivision can have multiple versions created and loaded on demand. The participant who has control of a subdivision

can accept versions in such a way that only the version of the subdivision is replaced and no other subdivisions are affected.

6) Another aspect of this invention is the process whereby a current work product with subdivisions can have the latest version retrieved from the source that persists information in such a way that any subdivisions under control of the participant is not overwritten.

7) Another aspect of this invention is the process whereby the participant who has control of a subdivision can accept alternatives in such a way that only the alternative of the subdivision selected is replaced and no other subdivisions affected.

8) Another aspect of this invention is the process whereby one participant who does not have control of a subdivision and is working offline on this subdivision transitions to working online. There is a process that recognizes changes to this subdivision and automatically takes these changes as a suggested alternative for the subdivision while not overwriting what currently exists in the persisted states such as, but not limited to, a database. This is a powerful enabling process that combines processes 3 and 4 above: offline actions to subdivisions not under control of an agent can be discerned when moving to an online mode and the agent is given the option of creating these actions as alternatives to existing work. The creation of these alternatives causes no changes to the work product not under the control of the agent and can provides notification, in a variety of means to the agent or agents, who may have control of these subdivisions.

9) Another aspect of this invention is the process to only work on part of a work product at a time. For example, a subdivision can be downloaded from another source and work can proceed on this subdivision alone without knowing about or accessing any container subdivision. For example, a powerful mobile device, such as, but not limited to, a

wireless handheld device could work on just one subdivision without having the whole work product, such as, but not limited to, a document downloaded. For a specific example, a human or non-human agent may receive a price change which is a subdivision to a sales contract, this agent could then modify this price and/or provide an electronic signature to the change. The work could be performed on the handheld device and then saved back to a central site to be incorporated, or the mobile device could be used strictly as an input device where the collaboration engine software is running on a central site.

10) Another aspect of this invention is the process where a subdivision can be further subdivided into subdivisions. Another related aspect of this invention is the process where subdivisions can be aggregated into a subdivision that contains these subdivisions.

11) Another aspect of this invention is the process where security and permissions can be applied to each subdivision separately. For example, one subdivision can be writable for a certain participant while another is not, i.e., there can be permissions for the human or non-human agent that determine a various set of actions that be performed on a subdivision.

12) Another aspect of this invention is the process where one can control what subdivisions of a container are downloaded or transferred with a container subdivision. For example, from another computer only the parts outside the subdivisions within a container could be downloaded. This could be done on a demand basis and the benefits of this are many:

    a) Reduced bandwidth to transmit this portion.

    b) Less storage space and processing needed at the receiving end allowing for smaller and more portable devices.

c) Higher level of security – only portions that were permitted to be transferred or downloaded would be transmitted. For example outside a given physical or transmission area, certain subdivisions could not be transmitted.

13) Another aspect of this invention is the process where one can control what subdivisions of a container are stored. For example, it may reduce storage techniques if the subdivisions are stored only once and then recombined dynamically as their container subdivision is loaded, instead of storing subdivisions with the container.

14) Another aspect of this invention is the process where there can be more directed "push" and "pull" of subdivisions. For example, many times not all participants need to know everything or when there is a change. Having the ability to divide monolithic work products, when some participant wants to notify others of a change, then these changes can be "pushed" in a more specific away that will reduce information overload for those receiving. On the other hand, some participants may want to be specifically notified when a particular subdivision is changed. This process could entail such things as sending some notification, such as, but not limited to, emails when a modification to a subdivision has occurred. On the receiving end this process could include automatic retrieval of the subdivision when clicked-on by the receiver of such notification. In addition on the pull side, human and non-human agents can determine what they want to receive.

15) Another aspect of this invention and related to the last aspect, is the process where there is greater management control of who has read a particular subdivision. The date and time of reading a subdivision or an "electronic signature" could be used to record when a participant has acknowledged when a change has occurred.

16) Another aspect of this invention is the process of initiating workflow actions at the subdivision and not just the whole work product level.

17) Another aspect of this invention is the process of applying project management actions at the subdivision and not just at the whole product level.

18) Another aspect of this invention is the process whereby logical subdivisions can be created within a work product. While many, but not all of the processes, described above would be available, the process to create logical subdivisions enable powerful additional aspects of this invention:

   a) Different views of the same document could be afforded for different participants. Whereas there can only be one physical division of a work product, there can be many logical divisions of a work product. For example, this process may allow different participants or the same participant to logically divide up a work product in different ways

   b) Depending on the privileges identified for a work product or subdivision, only logical subdivisions identified by a particular participant could be presented to that participant.

   c) This enables the process to relate different logical and/or physical subdivisions together. For example, one subdivision of the document may be related and identified as a cause for another subdivision.

19) Another aspect of this invention is the process whereby new subsets of the existing work product are created without creating physical or logical subdivisions of this particular work product. For example, it may be useful to create new work products from subsets of an existing work product by some means such as, but not limited to, highlighting some

subset, then creating a new work product that is created part of this or some other project. This relates to a degree to the description of the process in 20a below, but adds the concept of simple reusability of subdivisions and their manifold relationships.

20) Another aspect of this invention is the process where subdivisions of the same and/or different work products could be related in a logical way. This process would enable, but not be limited to the following:

a) This ability to relate logical and/or physical subdivisions is a powerful way to dynamically create record-structures by non-programmers and programmers, and/or non-human agents. Currently, database records are static descriptions of related attributes and creating these structures requires extra substantial training. However, at a logical level, these structures are just related, persistent attributes. Since subdivisions are individually created and persist, multiple logical records can be created easily by programmers and non-programmers, and/or non-human agents who just need to identify the subdivision and the logical connection of these subdivisions. Along with this, the ability to duplicate a subdivision could allow to duplicate all structures of the subdivision. This permits a simple method to "add" records. In this case, the adding of records can be of a physical and logical level.

b) Related logical subdivisions could be navigated through some interface like, but not limited to Collaboration Explorer. Navigation only mode would cause a jump to these subdivisions of any type, including, but not limited to multi-media. For example in a related chain, one logical subdivision could be a film clip, another a cell in a spread sheet, another a figure in a diagram.

c) Related logical subdivisions could be combined for display, printing out, or storage as an output file.

21) Another aspect of this invention is that the process can be implemented in a variety of means. For example the processes incorporated within collaboration engine technology can be used on, but not limited to, the following:

a) a single machine and single user where there are advantages to dividing work products into subdivisions,

b) peer-to-peer,

c) client-server,

d) over LANs, intranets, and the internet,

e) within application service providers that provide these processes to participants.

22) Another aspect of this invention is the process whereby offline work occurs. Currently, offline work is the ability to work with a copy of the work product that is recognizable by the application and where one is not using Collaboration Engine Technology. For example, one can work with a local copy of a Living Document within Word without being connected to a Collaboration Engine. However, aspects of this invention includes working offline whereby everything is the same as working online except there is no connection with other participants and information is persisted locally, such as, but not limited to, a local database. When transitioning to online, the locally persisted information would be synchronized with the central location that is being used to persist information for the project. For example, one could use a replicated database structure whereby when transitioning to online, the database automatically updates databases within the existing network structure.

23) Another aspect of this invention is the process whereby persistence of the data is just incorporated with the existing file structure.

24) Another aspect of the invention is the process where subdivisions that are created are associated with some template of metadata. For example, assume that some physical or logical subdivision is created within a document for the purpose of creating notes. Information such as page, author of work product, etc. would be automatically associated with this. Comments on the note could be created as explanatory drilldown notes.

25) Another aspect of this invention is the process where subdivisions can have additional processes applied to them. For example, a logical or physical subdivision that has alternatives associated with them could have votes associated with the alternatives. The alternative receiving the highest votes could automatically replace existing subdivision. The aspect of the invention that is important here is the integration of application of additional processes, such as, but not limited to, voting, multi-criteria decision analysis, weighting, etc.

26) Another aspect of this invention is the process where templates of work products with existing subdivisions can be used in novel situations.